Indo-US Financial Institutions Reform and Expansion Project - Debt Market Component FIRE(D)

Project Notes

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Innovative Approaches to Solid Waste Management in India

Focus on Private Sector Participation

As the challenge of providing urban environmental services in India's growing cities becomes more and more pressing, beleaguered urban managers are turning toward private sector participation. Various approaches to privatization exist, offering cost savings, new technologies, improvements in efficiency and effectiveness and reduction in the need for permanent sanitation staff. Still, new approaches require flexibility and adaptation to become effective. This Project Note describes innovations and lessons learned in several Indian cities, and discusses efforts of the FIRE(D) Project to help cities take a strategic approach to solid waste management and develop commercially viable solid waste management projects in the cities of Surat, Kolhapur and Tiruppur.

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Innovative Approaches to Solid Waste Management

As India's cities begin to grow at an accelerating rate, urban managers are faced with overwhelming demand for services and inadequate resources with which to provide them. And as densities increase and cities sprawl, solid waste is becoming a visible problem. In this scenario, privatization offers a promising alternative to public sector management. Several Indian cities have taken steps to introduce private sector participation (PSP) in various forms, and while results have been encouraging, it is also clear that frameworks for PSP will have to evolve, depending upon the capacity of local bodies, legal and institutional provisions and characteristics unique to the private sector.

PSP in solid waste management offers several advantages, the first of which is cost savings, which are closely related to improvements in the efficiency and effectiveness of services. Privatization can also open the door to introduction of new technologies. Moreover, it can reduce the establishment costs of keeping and managing a full complement of permanent staff. The cities of Navi Mumbai, Hyderabad, Surat and Rajkot have each experimented with private sector participation in various aspects of solid waste management with encouraging results.

PSP in Navi Mumbai

In its role as the developer and manager of Navi Mumbai, a new township on the periphery of greater Mumbai, the City and Industrial Development Corporation of Maharashtra, Limited (CIDCO) has enlisted private sector participation in a number of city services, ranging from sewerage to street lights. For solid waste management, CIDCO has taken two approaches to engaging the private sector. One is the use of sanitation contractors, who sweep roads and footpaths, and collect and transfer garbage to street containers. The second is transport contractors who then transport the garbage, using CIDCO vehicles, from containers to disposal sites.

Under both types of contracts, work is allotted for a period of six months, which is extended for another six months if performance is satisfactory. CIDCO has

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the right to levy penalties for unsatisfactory work or in the case of complaints from the community, and if work is continuously unsatisfactory, the Chief Health Officer is authorized to terminate contracts with three days notice. A security deposit of 5% of contract value is kept by CIDCO, which is returned without interest at the completion of the contract.

CIDCO estimates that the use of private contractors results in a cost reduction of 40%, and has eliminated the need to hire and manage 450-500 sanitary workers. In 1992, Navi Mumbai Municipal Corporation (NMMC), covering four of Navi Mumbai's seven nodes, was formed to assume management responsibility from CIDCO, and NMMC plans to continue the use of private contractors for solid waste collection and transport.

PSP in Surat

In 1994, the city of Surat experienced an outbreak of the bubonic plague which resulted in severe financial losses to the city and the country as a whole. This episode, however, served to focus attention on public health and, in particular, the management of solid waste in the city. The Surat Municipal Corporation immediately undertook a number of steps to improve its management of solid waste disposal and other urban environmental services. Today, Surat is one of the cleanest cities in India and has become a model to which other cities look for direction.

Reforms undertaken in Surat include an accelerated campaign to clean sewage lines and septic tanks; major road widening; demolition of unauthorized construction; and cleaning of high density roads during day and night. The administrative structure for solid waste management was also decentralized to the charge of six deputy health officers and 52 sanitary inspectors, and additional staff and vehicles were provided for solid waste management. Surat also undertook privatization of solid waste services.

Private contractors have been engaged in road sweeping, garbage collection and transportation under a variety of arrangements. Sweeping is paid on the basis of square meter coverage, and the entire road surface must be swept. Garbage collection and transport is compensated on the basis of tonnage delivered to disposal sites, and a maximum of 4 tons per load has been imposed to prevent artificial weighting of trucks with brickbats and other heavy items. Vehicles are provided by contractors and payment made per vehicle, but corporation staff are utilized for loading and unloading of garbage refuse. Surat's experiences with private sector participation have been extremely encouraging and the city plans to continue private provision of solid waste services with the construction and operation of a disposal plant.

PSP in Rajkot

Six years ago, the city of Rajkot in western Gujarat took action to privatize a wide range of urban services. These included the maintenance of public toilets, street lights, gardens and the zoo; security; maintenance of drainage pumping stations; collection of toll taxes; and distribution of tax bills. Privatization was also pursued for street sweeping and collection and transportation of solid waste, with sweeping and collection contracted separately from transportation. Though savings have been realized in both areas, overall results have been mixed.

Sweeping and collection was privatized in only two of the city's 19 wards – only about 5% of total urban area – and cost savings have been estimated at about 15%. Transportation of solid waste, however, was privatized in twelve of the 19 wards which generate about 80% of the city's waste. Waste is transported to primary collection centers by contractors with the use of their own vehicles, and payment is made on the basis of weight, determined at a public weighing machine. A maximum of 4 tons per vehicle was imposed to prevent overloading of trucks and artificial weighting. A team of inspectors cross-checks weighing receipts, and in the event of a discrepancy, the contractor is not paid for transport of the garbage. Heavy penalties are also imposed for repeated complaints. The rate paid for transport is determined through an annual contract auction.

The Rajkot Municipal Corporation (RMC), however, has decided not to fully privatize its solid waste transport responsibilities. Once the rainy season began, contractors stopped work and demanded an increase in benefits. In response the city threatened to terminate contracts and take legal action, and the strike ended after four days. But the RMC regards solid waste transport as an essential service and now finds it necessary to maintain an emergency fleet of transport vehicles to maintain daily services. Overall, the city has estimated that privatization of transport services has resulted in a cost savings of 23%.

PSP in Hyderabad

The Municipal Corporation of Hyderabad has privatized solid waste management in 58 areas of the city, covering 200,000 households. Contracts cover sweeping, collection and transport of waste to municipal dumping grounds, and tenders were invited from any business, organization or individual with adequate capability to perform the work. The tender schedule identified service areas to be covered and precise

boundaries; population; distance to be covered daily; estimated daily quantity of garbage; and the location of the dumping grounds. Work is carried out on all days of the year, including public holidays, and is to be completed before 8 am on main streets and before 11 am on all others.

In response, offerors were asked to indicate the number of workers and vehicles intended to be employed, types of equipment, identity and background of the work supervisor, and a monthly rate for undertaking the work. Based on initial experience, a number of limitations of this system have been identified, relating to inadequate monitoring and record keeping, as well as the lack of a transport plan on the part of the contractor. In response, changes have been introduced which are expected to improve the system, such as preparation of workplans and regular reporting to the sanitary supervisor.

The Surat Solid Waste Disposal Project

Though Surat has been nationally recognized for its success in management of solid waste, it is now facing a serious deficiency in its solid waste disposal capacity. Four of the garbage disposal sites for the city have recently been filled to capacity, leaving only one remaining facility. With support from the FIRE(D) Project, the city is now moving forward with plans to construct an additional disposal facility and it plans to implement this project through PSP.

As a first step, FIRE(D) helped the city to develop a pre-qualification document through which it will identify qualified firms or joint ventures with experience in the operation of waste treatment and processing utilizing proven technology. In addition to providing a basic project description, the pre-qualification document requests information from interested providers on three weighted factors: financial capacity, technical experience and key personnel of the firm. This information must be provided in detail, and formats for submission are also included.

The pre-qualification document is expected to be issued in the very near future and will be followed by the issuance of a detailed project description document. Once qualified firms are chosen, an RFP will be issued to these firms, followed by proposal submission, evaluation and selection.

The project is designed on a build-own-operate basis, and while the Surat Municipal Corporation will ensure a regular supply of a specified quantity of garbage, the contractor must pay a price for the garbage as well as annual rent for the site. The concession will run for a period of 25 years.

One of the advantages of private sector participation is that it encourages the introduction of new technologies. In this case, options include pelletization, biomass energy production and composting of organics. The pre-qualification document and RFP do provide that proposed technologies must be eco-friendly, but the choice of technology is that of the contractor. For this reason, an appropriate site for the facility has been identified by the city which offers road access and connections to electricity and water supply.

Strengthening the Kolhapur Solid Waste Management System

Solid waste generated in Kolhapur is disposed of in open dumps, placing residents at the risk of soil and groundwater contamination as well as decline in air quality. There is no organized system for storage of waste from shops, and though the Kolhapur Municipal Corporation (KMC) has constructed two open garbage houses in the market, vendors do not utilize these facilities consistently. So the KMC enlisted consultants from the private sector to assist in upgrading its solid waste management system over the next two decades. Throughout the process, FIRE(D) has been providing advisory assistance to the KMC as well as AIC Watson, the consultants selected by the city.

With technical assistance from the FIRE(D) Project, AIC Watson carried out a field measurement program which analyzed the number of vehicles, trips to disposal sites and quantities and composition of waste, and then used this information to produce system projections up to the year 2021. Presently, about 60 percent of the 160 tons-per-day (tpd) of solid waste generated is successfully collected, transported and disposed of in designated locations, and the remaining waste is burned or dumped in open areas. By 2021, total waste generated is expected to increase to 270 tpd. Based on these projections, a solid waste disposal and treatment project has been designed which will build on planned improvements to the existing management system.

The KMC has decided to implement this project with private sector participation on a Build-Operate-Transfer (BOT) basis. Under a 30-year concession agreement, the municipality will provide a long term lease for land to the selected operator, and the concessionaire will be responsible to design, build, operate and maintain the facility, and to finance these activities. Thus, the operator must expect to generate profits, and two likely options are controlled aerobic composting and biogas production. An RFP has been issued to pre-qualified bidders, and proposals are expected in early 1999. The FIRE(D) Project will continue to provide technical assistance to the city and its consultants throughout the evaluation and contracting process.

Developing a Solid Waste Management Strategy for Tiruppur

As a demonstration city, the municipality of Tiruppur has worked closely with the FIRE(D) Project on strengthening of municipal administration, ranging from municipal accounting to identification of the city's infrastructure needs and priorities. The FIRE(D) Project has also assisted the partners of the Tiruppur Area Development Program – The Tiruppur Exporters Association, Infrastructure Leasing and Financial Services Limited, and the New Tiruppur Area Development Corporation Limited – in the development of a water supply and sewerage system which will benefit the city's growing industries as well as currently unserved consumers in low income communities of the city and surrounding villages.

In light of growing solid waste management challenges in the city, the FIRE(D) Project sponsored a study tour for municipal officials and elected women councilors, many of whom represent low income communities, to visit innovative solid waste projects in Ahmedabad and Surat in 1997. Building on this experience, the Project sponsored an assessment of Tiruppur's solid waste situation.

The assessment highlighted problems such as insufficient storage and segregation of recyclables; lack of primary collection; and irregular delivery of services such as sweeping. It also pointed to the unscientific disposal of waste as an environmental health threat, and the inadequate administrative capacity of the city. The assessment resulted in recommendations for improving solid waste management in Tiruppur.

During a two-day workshop in early 1998, a solid waste management strategy was discussed and developed, and this strategy was unanimously approved by the municipal council. The strategy adopted by the council calls for a reorganization of the city's solid waste management department and augmentation of its staff and also outlines a plan for disposal that utilizes composting, new sanitary landfills and incineration. With an overall estimated cost of Rs. 8.77 crores, a new composting facility is to be developed by the private sector on a build-own-operate basis at a cost of Rs. 4.5 crores, and privatized management of an incineration facility for biomedical waste is planned. An Action Plan for implementing the strategy is now under development.

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This *Project Note* is based on two FIRE(D) Project Technical Reports: *Private Sector Participation in Solid Waste Collection and Transportation* by Chetan Vaidya; and *Workshop on Solid Waste Management in Tiruppur,* by P.U. Asnani.

Indo-US Financial Institutions Reform and Expansion Project - Debt Market Component FIRE(D)

The mission of the Indo-US FIRE (D)Project is to foster the development of a commercially viable urban infrastructure finance system to finance improvements in environmental services for all citizens, including the urban poor. It is being implemented through four objectives:

- Development of commercially viable urban environmental infrastructure projects in selected demonstration cities;
- Development of a commercially viable urban environmental infrastructure finance system;
- Improvement of municipal financial management as well as the administration of environmental services in demonstration cities;
- Strengthening the capacity of public and private sector professionals and technicians to achieve these objectives.

This new approach, which emphasizes commercial viability, enables Indian cities and urban authorities to respond more effectively to the greatest needs: increasing access to services and improving service levels. Significant benefits for the poor, in particular, can be achieved through a commercial orientation.

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